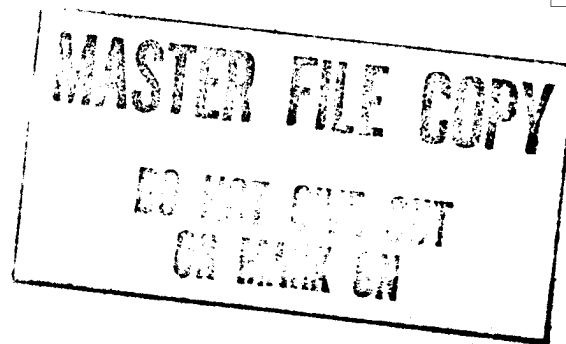




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# Singapore: The Push for Productivity

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An Intelligence Assessment

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EA 84-10107  
May 1984

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# **Singapore: The Push for Productivity**

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**An Intelligence Assessment**

This paper was prepared by [ ] of the  
Office of East Asian Analysis. Comments and queries  
are welcome and may be directed to the Chief,  
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**Singapore: The Push  
for Productivity**

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**Key Judgments**

*Information available  
as of 13 April 1984  
was used in this report.*

Singapore's economic planners recognize that a rapid advance in productivity is necessary to maintain the city-state's high economic growth rates—given the projected slow growth in the labor force, a severe shortage of skilled labor, and the government's desire to phase out all foreign workers by 1991. Prime Minister Lee Kuan Yew is attempting to deal with the manpower problem by:

- Expanding enrollments in postsecondary educational institutions and restructuring the general education system to produce higher quality graduates.
- Trying to “upgrade” the labor force by offering incentives for educated women to have more children.
- Backing down slightly on the phaseout of foreign workers by extending the departure date for skilled workers from Hong Kong, Taiwan, Macau, and South Korea.

The government's approach has been typically heavyhanded and is causing considerable public discontent. Political observers note:

- A public outcry not often seen in rigidly conformist Singapore over the “eugenics” campaign.
- Heated debate over a proposal to raise the retirement age.
- Resentment against the government's drive to emulate Japanese labor relations.

Lee appears willing to accept short-term complaints to assure that per capita income growth does not fail to match the impressive growth rates of the 1970s and early 1980s. His program to push productivity, however, is a long-term approach. In the meantime, there is a strong chance that the rapid growth of a more highly educated and Westernized middle class—a certain outcome of the revamped education policy—will increase discontent with Lee's authoritarianism. By the end of the decade, this could weaken the political cohesion that has characterized Singapore since independence.

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***The Trend to High-Technology  
Industry: Recent Developments***

*The move to higher-value-added production is most visible in Singapore's large and growing electronics sector. The industry—the largest employer in the manufacturing sector—has been undergoing considerable structural change in the past two years. Japanese companies, for example, have stopped assembling cheap black and white televisions for the African and Middle Eastern markets, and instead have trained their workers to produce color televisions for export to the United States. One US electronics firm, while moving its labor-intensive operations away from Singapore, taught its staff to do more sophisticated testing and servicing of products.*

*Over the past two years, Singapore has emerged as an important producer of a variety of computer-related products for world markets. Hewlett Packard's calculator division has centered its assembly operations in Singapore, IBM produces keyboards for several products for worldwide use, and National Semiconductor manufactures integrated circuits for random access memories, hybrid circuits, and specialized military electronics. On a larger scale, the manufacture of disk drives is becoming an important element*

*in Singapore's high-technology production mix. The Economic Development Board, the government's key institution for directing private investment, forecasts that disk drive exports will reach US \$240 million this year—up from \$60 million in 1982. The movement of disk drive manufacturers to Singapore has also resulted in a growing secondary industry to meet producer's needs for components and services. One firm estimates that it will soon be able to purchase 85 percent of its components locally.*

*The electronics industry is also moving into areas that represent state-of-the-art technology. Texas Instruments and SGS-Ates—an Italian company—have both announced plans to begin the delicate process of fabricating silicon wafers in Singapore.*

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## Singapore: The Push for Productivity

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### The Push for Productivity

Since 1979, the Singapore Government has tried to boost labor productivity by moving the economy into higher-value-added, more capital-intensive industries. The plan is to make the city-state a high-technology manufacturing center and a regional center for service industries that provide consulting in computer software, engineering, and architecture and design, as well as the entire range of medical and other professional services.<sup>1</sup> The government has pursued this by:

- Increasing wages by 50 percent between 1979 and 1982 to discourage low-skill, labor-intensive operations from locating in Singapore and to encourage existing low-wage manufacturers to upgrade their operations.
- Offering attractive tax incentives to firms that invest in higher-value-added industries. Pioneer status—which provides for zero tax on profits for five to 10 years—is routinely granted to investors. The period of exemption can be longer than 10 years for projects involving advanced technology and long gestation.

In our judgment, the policies to upgrade the economy and boost productivity have produced encouraging results. Productivity growth has averaged 4.3 percent a year since the wage-correction policy was initiated in 1979—significantly higher than the 3.1 percent registered during 1974-78 (see table 1). Employment growth in labor-intensive industries has slowed appreciably and firms are upgrading their facilities (see table 2). Many manufacturing and technical services companies, for example, have installed computer-aided design and manufacturing systems, and progress is being made on robot automation.

Moreover, foreign and domestic investments increasingly have been concentrated in high-value-added industries and in knowledge-intensive services—an

**Table 1** *Percent*  
**Singapore: Labor Productivity Growth <sup>a</sup>**

Industry	1974-78	1979-82
<b>Total</b>	<b>3.1</b>	<b>4.3</b>
Manufacturing	-0.9	1.9
Agriculture and fishing	5.1	12.5
Utilities	13.5	12.3
Construction	4.4	7.9
Trade	3.1	3.2
Transport and communication	9.2	8.0
Financial and business services	-7.8	7.0
Other services	6.1	4.0

<sup>a</sup> Output per worker. Average annual rate of change.

encouraging development for continuing the economy's momentum over the short term. Fixed investment per worker and value added per worker reached US \$47,000 and \$55,000, respectively, in 1982—four times higher than the average in Singapore's manufacturing sector. Investment spending has shifted from labor-intensive industries, such as textiles, to the manufacture of computers and related equipment, electronic components, machinery parts, and construction materials.

### Problems on the Horizon

Singapore's economic planners believe that rapid growth of productivity is the only way to reach the government's economic growth target of 8 to 10 percent annually. The city-state will probably not achieve its growth objective, however, because of

**Table 2** Percent  
**Singapore: Employment Growth, by Industry <sup>a</sup>**

	1974-78	1979-82
<b>Total</b>	<b>3.7</b>	<b>4.5</b>
Manufacturing	7.3	5.6
Capital intensive	2.3	3.6
Labor intensive	5.1	2.7
Agriculture and fishing	-3.6	-10.3
Utilities	-2.8	-5.0
Construction	NEGL	8.7
Trade	2.8	3.1
Transport and communication	3.1	4.4
Financial and business services	17.5	8.7
Other services	0.2	3.2

<sup>a</sup> Average annual rate of change.

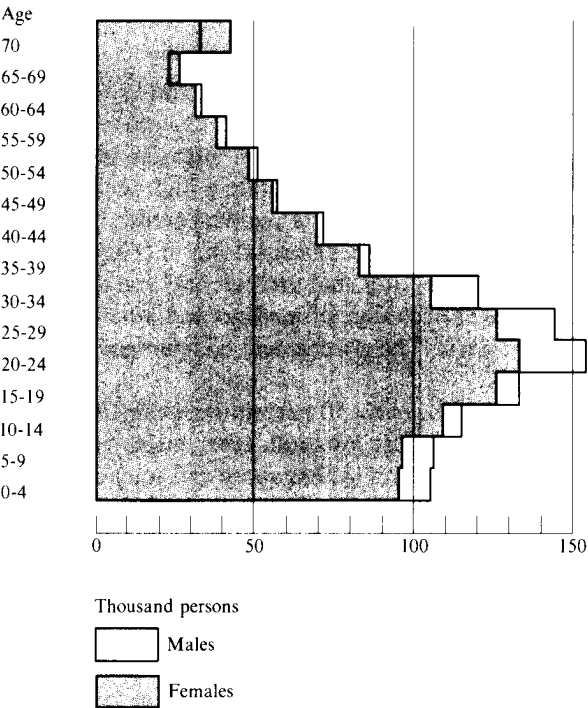


demographics and shortages of skilled labor. The future labor force, for example, is largely set because the age groups that will provide work force expansion during the remainder of the century are already in place (see figure 1). The government's successful family planning efforts in the 1970s—which included the high-profile “stop at two” campaign—are resulting in a marked slowdown in the growth of the working age population (ages 15 to 69). Our analysis indicates that this growth rate will drop from the present 3-percent annual rate to slightly less than 1 percent by the late 1990s. We expect labor force growth to slow from the current 2-percent annual rate to only half a percent a year in the late 1990s (see figure 2).

Slow growth in the native labor force will be exacerbated by the government's decision to phase out all foreign workers—mainly Malaysians—living in Singapore on work permits by 1991.<sup>2</sup> In our judgment, the policy is aimed at avoiding many of the kinds of social problems migrant workers cause in industrialized countries. Although the government does not

<sup>2</sup> Work permits are needed by all foreign workers earning less than US\$240 per month. They differ from employment passes, which are special visas allowing a foreigner earning more than US\$240 a month to work in Singapore.

**Figure 1**  
**Singapore: The 1983 Population**



Thousand persons  
Males  
Females

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publish data on foreign workers, various sources estimate the number at 100,000—about 8 percent of the labor force. If the government pushes ahead with its plan, labor force growth will be even slower than our estimate in the 1980s, and even the labor force itself will decline slightly later in the decade.

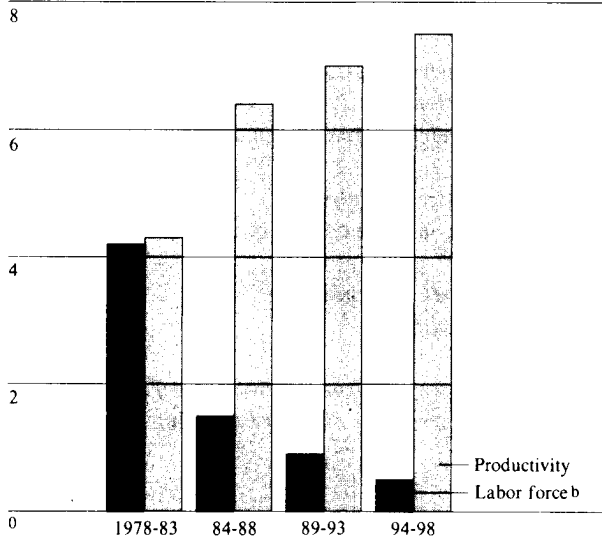
**The Skills Shortage**

A shortage of skilled workers will compound the problem of unfavorable demographics. Foreign companies operating in Singapore are already having trouble finding engineers and other highly skilled workers. In 1980, only 27 percent of the labor force

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**Figure 2**  
**Singapore: Labor Force Growth and Productivity Growth<sup>a</sup>**

Average annual rate of growth



<sup>a</sup> Productivity growth needed to reach 8-percent economic growth target. Assumes employment growth equal to labor force growth.

<sup>b</sup> Assumes no phaseout of foreign workers.

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had completed secondary school, and only 3.5 percent had completed education beyond the secondary level. One firm—a joint venture between an Indian and US company planning to build large computers—has not been able to hire a single Singaporean engineer. The need for educated and skilled personnel is underscored by the fact that 99 percent of graduates from the National University of Singapore find employment within six months. [redacted]

In our judgment, the shortage is already having a detrimental effect on the economy. Many manufacturers have been forced since the end of last year to cut back expansion plans and are finding it increasingly difficult to fill new orders, according to a US consulting firm. Employee raids are becoming common. The result is a high rate of personnel change, with one firm reporting a 5-percent-a-month turnover rate. [redacted]

We believe the recent decision to tighten procedures for granting employment passes to higher paid expatriates will add to the skilled labor crunch. Some 20 percent of all managers, engineers, and technicians in Singapore are expatriates. Although most expatriates still receive passes, the process is no longer routine and the government is now asking for extensive documentation to prove claims of skills and education. The US Embassy reports some prominent managers of US companies have been asked to produce the originals of their college degrees, and some permits have been denied without explanation. The policy appears to be both a response to complaints that too few top positions are going to Singaporeans and an effort to curb the fraudulent practices of exaggerating or misrepresenting the need for expatriates. [redacted]

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According to a US consulting firm, many foreign companies—particularly Japanese firms—are concerned about this restriction on the use of expatriates. More than other foreign investors, the Japanese are accused of staffing their senior posts with Japanese expatriates because they are reportedly reluctant to promote Singaporeans into management. In response, several Japanese firms have threatened to relocate to countries where expatriates are welcome—a development that would have serious implications for the foreign-investment-dependent economy. Minister of Trade and Industry Tony Tan has tried to reassure the international business community that the basic welcome to legitimate expatriate managers and technicians has not changed, but the tighter policy is continuing. [redacted]

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### Policy Options for Productivity Growth

#### Exhortation

Like other public programs, Lee Kuan Yew's approach to increasing productivity features a heavy dose of exhortation from the top. Singapore's 2.5 million citizens have been barraged over the past two years by a campaign to expand public awareness of productivity. As with many other publicity campaigns, productivity is heavily promoted through the

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mass media, promotional materials, seminars, and exhibitions. The National Productivity Board (NPB)—which is spearheading the productivity movement—has designated a Productivity Month, during which school children sing productivity songs, workers take a productivity pledge, and “Teamy”—the productivity mascot—travels to the planet of Productivity in a newspaper cartoon strip. [ ]

In 1982, the government also began a zealous drive to emulate Japanese labor-management techniques. Labor relations in the United States and Britain, on the other hand, are held up as examples of how the economy can be damaged by poor company-worker relations. The campaign focuses on Japanese consensus labor relations and emphasizes that management needs to spend considerable time motivating workers. Senior government officials regularly extol Japanese workers as models for Singaporeans and praise Japanese industrial relations. The government is encouraging local companies to try out aspects of the Japanese system, such as quality-control circles. [ ]

Singaporeans usually respond to Lee’s publicity campaigns with polite indifference, but the emphasis on the Japanese approach is creating resentment. Workers complain about the way they are unflatteringly compared to their Japanese counterparts. Many argue that the campaign has been taken to absurd limits. For example, the government has suggested Singaporeans emulate the deep bowing with which the Japanese greet one another. The public backlash has forced the government to regroup somewhat, with senior government officials now admitting that some younger political leaders have gone overboard. Lee conceded last year that Singapore may have to find its own style and said that he would not push a proposal for a Japanese-style company welfare scheme. [ ]

#### **Revamping Education Policy**

In a more concrete attempt to alleviate the shortage of skilled workers, the government is trying to accelerate the development of highly trained workers—particularly engineers and physical scientists. Since 1980, the government has expanded enrollments in higher education, revamped the general education system, and established numerous vocational training institutes. The city-state has underscored this emphasis on education by boosting real spending per pupil by an

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#### **Singapore: Vocational Education**

##### **German-Singapore Institute**

*Opened in 1982 to train instructors and technicians in production engineering.*

##### **French-Singapore Institute**

*Became operational in 1983. Trains highly skilled technicians in electrotechnology and electronics.*

##### **Institute of Systems Science**

*Provides a nine-month course in computer training.*

##### **Systems Education Center**

*Computer training.*

##### **Japan-Singapore Institute of Software Technology**

*Emphasis on computer software training at the technician level.*

##### **CAD/CAM Training Unit**

*Joint operation between Economic Development Board and US manufacturer to provide training on the use of computers in the design and production process.*

##### **Robotics Training Unit**

*Provides training in industrial robotic technology.*

##### **Japan-Singapore Training Institute**

*Offers courses in industrial electronics and process control engineering.*

##### **Vocational and Industrial Training Board**

*Operates 15 training institutes, which offer full- and part-time programs in about 70 courses.*

##### **Construction Industry Training Center**

*To be opened this year. Designed to reduce Singapore’s reliance on foreign construction workers.* [ ]

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average 25 percent a year since 1980. In real terms the government now spends three times per pupil what it did in 1973 (see figure 3). [ ]

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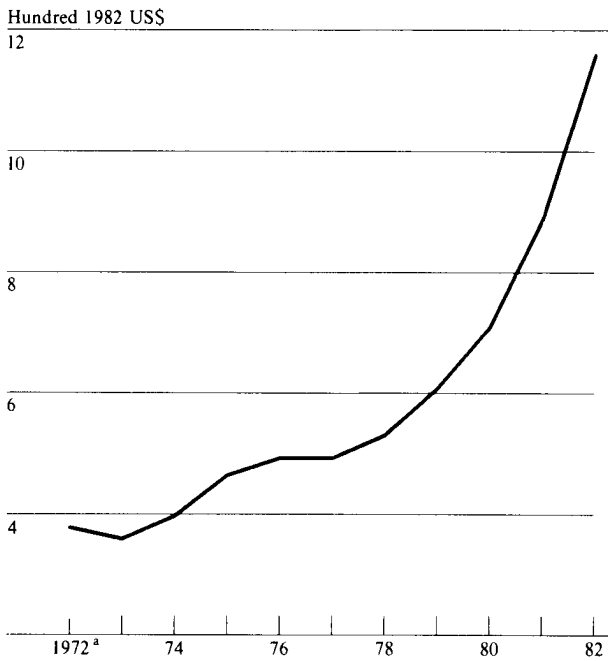
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**Figure 3**  
**Singapore: Educational Spending per Pupil**



<sup>a</sup> Fiscal year beginning 1 April.

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Enrollment in Singapore's five postsecondary institutions has been increasing by an average annual rate of nearly 9 percent since 1979, with the government effectively channeling students into engineering and science. Despite the recent enrollment increases, these institutions—particularly the National University of Singapore—have maintained high and strict admission standards, and the quality of education is high by international standards, according to a World Bank study. Still, the government has not been able to admit the numbers needed to alleviate the labor shortage. Government planners project that Singapore's postsecondary institutions will need to register as many as 35,000 students each year during the 1980s if growth targets are to be met. Enrollment last year stood at only 25,000, and, at the present rate of growth of enrollment, the 35,000 goal will not be reached until the late 1980s.

**Singapore: Postsecondary Institutions**

**National University of Singapore**  
Established in 1980 following the merger of the University of Singapore and Nanyang University. Offers typical range of university courses. Enrollment: 11,940 (1983)

**Nanyang Technological Institute**  
Established in 1981. Curriculum designed to produce practice-oriented engineers at the bachelor's degree level. Enrollment: 1,270 (1983)

**Singapore Polytechnic**  
Offers diplomas in civil, electrical, mechanical, production, marine, and structural engineering, architectural draftsmanship, building construction, land surveying, and chemical process technology. Enrollment: 6,180 (1983)

**Ngee Ann Polytechnic**  
Conducts courses at the technician level in mechanical engineering, electrical and electronic engineering, shipbuilding and repair technology, and building maintenance and management. Also offers business studies and computer studies. Enrollment: 4,840 (1983)

**Institute of Education**  
Provides training for preprimary, primary, and secondary school, and junior college teachers. Enrollment: 1,000 (1982)

To boost the number of high-quality students available for postsecondary institutions, the government restructured the general education system in 1980. The new system is based on a belief in the importance of language skills and is highly competitive at every age group. For example, performance in the first three years of primary school determines how much education students ultimately receive and thus to a large extent their future career paths. The first three years of school (students 6 to 8 years old) emphasize the

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acquisition of language skills to give students a strong foundation in English for learning mathematics and science. At the end of grade three, students are placed into one of three groups, depending on their language abilities. The strongest two groups remain in primary school for an additional three to five years before taking an examination that will place them in categories for high school. Students with the weakest language skills study another five years before choosing—at 14—either to enter the job market or pursue vocational training. This emphasis on tracking students on the basis of language skills continues throughout secondary school. [ ]

#### **And Social Engineering**

The darker side of the push for productivity is a government attempt at eugenics. Last summer Prime Minister Lee expressed concern that educated women—defined as at least secondary school graduates—have too few children, while uneducated women have too many. Over 30 percent of less educated mothers have four or more children compared with only 1.5 percent of educated mothers. Lee claimed a continuation of this trend would have serious repercussions as “the economy will falter, the administration will suffer, and the society will decline.” [ ]

As an incentive to redress this “imbalance,” the Education Ministry recently announced a policy that gives children of educated women who have three or more children priority placement in Singapore’s better schools. The policy could have considerable impact because there are far more children of primary school age than can be accommodated by the better schools. Uneducated mothers with three children or more are near the bottom of the list. If uneducated mothers have themselves sterilized after having two children, their children will have better opportunities. [ ]

The premise of the government’s argument—that educated women bear and rear smarter children—has touched off a public debate not often seen in rigidly conformist Singapore. Although standing to gain the most from the eugenics campaign, educated Singaporeans have surprised political observers by launching the greatest outcry over the policy. Local newspapers have been deluged with letters criticizing the government, and the local Roman Catholic Church has condemned the policy as discriminatory. In addition,

the government has been petitioned by several university student groups to end the policy. The move has also revived the sensitive issue of racial inequality in largely Chinese Singapore.<sup>3</sup> Critics argue that any program that favors the educated clearly favors the Chinese—to the detriment of Malays and Indians. [ ]

The government appears to be undaunted by this criticism. The 1984-85 budget goes a step further in trying to encourage educated mothers to have more children by offering sizable tax incentives. Working mothers who have completed secondary school will receive tax exemptions of 5, 10, and 15 percent for their first, second, and third child, respectively. In addition, Deputy Prime Minister Goh recently indicated that the government is planning additional measures to encourage university-trained women to marry and have children. [ ]

#### **Short-Term Relief?**

Lee’s moves are long-term solutions. Students entering the National University of Singapore in 1984 will not graduate until at least 1988, and a student entering primary school this year will not graduate from college until the turn of the century. The shortage of skilled workers thus will continue for some time, and Singaporean officials expect it to hamper efforts to upgrade the economy at least through the end of the decade. Without other changes, economic growth—although high by international standards—will undoubtedly fail to meet the government’s target. [ ]

Singapore could improve the economic outlook by relaxing the policy of phasing out all foreign workers, and the government has recently begun to move in this direction. Skilled workers recruited from Hong Kong, Taiwan, Macau, and South Korea are now receiving two-year work permits renewable until 1991. Before the new policy, these workers—except those employed in construction, shipbuilding, and

<sup>3</sup> Singapore experienced racial disturbances in the late 1960s. [ ]

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domestic services—were expected to leave by the end of this year or by 1986 in special circumstances. The government has gone even further by stating that those workers from the four countries who have skills of value to the economy will be allowed to remain after 1991, if they become Singaporean citizens or permanent residents. Still, because Singapore is heavily dependent on foreign workers, the 1991 deadline will still cause difficulties, and further extensions are probable over the next several years. [ ]

The government may also try to prop up labor force growth by raising the retirement age from 55 to 60 and later to 65. Under a recent proposal, workers would be prohibited from withdrawing their savings from the Central Provident Fund—the country's compulsory savings system—until they reach these later ages. According to the US Embassy, public reaction to the move has been intense. The proposal could become an important election issue should Prime Minister Lee call early elections sometime this year, which now seems likely. [ ]

### Looking Further Ahead

No matter what short-term policies the city-state devises over the next several years, the lack of skilled labor will constrain productivity increases and, in turn, economic growth. Wage pressures for skilled labor will develop, and this will affect the attractiveness of Singapore to foreign investors—the lifeblood of growth over the past 15 years. Economic growth below the government's target would result in per capita income growth significantly below the 7.4-percent average annual rate Singaporeans became accustomed to in the 1970s—a prospect we believe is highly likely. [ ]

In any case, the skilled-labor shortage underscores the importance of education policy, which we believe is key to the long-run success of the productivity movement. Although the foundation for an improved and expanded education system is largely in place, questions about its efficiency remain. For one thing, the effectiveness of tracking students on the basis of language skills will not become apparent until the first

generation of tracked students graduate from post-secondary institutions in the mid-1990s. In addition, many Singaporeans—particularly the Chinese—worry about the cost of the policy in terms of lost cultural heritage, particularly as English becomes the instructional language in schools. [ ]

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In the short term, although public discontent over the productivity policy will continue, it will not, in our view, force Lee to alter his approach. For one thing, Lee seems willing to accept short-run criticism of his government to avoid more serious public dissatisfaction should economic growth fail to match the impressive rates of the 1970s. According to political observers, Singaporeans have put up with Lee's autocratic governing style largely because of the economic benefits that have accompanied his rule. [ ]

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Politically, the rapid growth of a more highly educated and Westernized middle class—a certain outcome of the revamped education policy—may increase discontent with Lee's authoritarianism. At a minimum, a larger educated class will probably result in a more viable political opposition to the ruling People's Action Party. Although some top party leaders view such an opposition as necessary to the continuing political development of Singapore, Lee is intolerant of political dissent and may react strongly. Strains between a more educated public and an authoritarian political leadership by the end of the decade may cause a weakening of the political cohesion that has characterized Singapore since independence. [ ]

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